DOCUMENT RESUME

ED 468 501 CE 083 822

AUTHOR	Litowitz, Len S.; Sanders, Mark
TITLE	Alternative Licensure Models for Technology Education. CTTE Monograph.
INSTITUTION	Council on Technology Teacher Education, Reston, VA.
REPORT NO	CTTE-16
PUB DATE	1999-00-00
NOTE	20p.
AVAILABLE FROM	For full text: http://teched.vt.edu/ctte/ImagesPDFs/Mono16AlternativeLicensure.pdf.
PUB TYPE	Opinion Papers (120)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	*Alternative Teacher Certification; Competency Based Teacher Education; Definitions; Educational History; Educational Trends; Elementary Secondary Education; Evaluation Criteria; *Evaluation Methods; Faculty Development; Field Experience Programs; Guidelines; Higher Education; Instructional Design; Instructional Development; Knowledge Base for Teaching; Literature Reviews; *Models; National Organizations; Position Papers; Professional Continuing Education; Program Development; Required Courses; *Teacher Competencies; Teacher Education; Teacher Improvement; Teacher Qualifications; *Technology Education; Trend Analysis; *Vocational Education Teachers; Work Experience
IDENTIFIERS	*Alternative Teacher Education; National Council for Accreditation of Teacher Educ

ABSTRACT

The licensure requirements for technology teachers vary widely from state to state. The goals of the alternative teacher licensure movement have been to allow more individuals to become certified as teachers more quickly and to attract more people with life experiences into teaching without the necessary completion of traditional undergraduate teacher preparation programs. Most generic alternative licensure models have evolved into programs targeting specific populations. Competency-based programs, both traditional and alternative, appear to be the way of the future. At least 14 different alternative licensure models currently exist. The following complementary components of a proposed model for alternative licensure for technology education were developed after a careful review of the literature and state licensure and alternative licensure regulations and key documents from the field of technology education: (1) a "conceptual model" combining the set of competencies adapted from the National Council for Accreditation of Teacher Education-approved curriculum guidelines with the limited licensure model already used in several states; (2) a set of suggested competencies for alternative licensure mode; and (3) a listing of possible course titles for proposed alternative licensure models. The model is based on the belief that alternative licensure should allow adequate flexibility without compromising the quality of the profession. (16 references) (MN)

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CTTE Monograph #16

Alternative Licensure Models for Technology Education

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Preface

The critical shortage of Technology Education teachers in the United States has prompted those both within and beyond the profession to consider alternative licensure strategies. Technology Education is in good company in this regard; the alternative licensure "movement" cuts across most school subject areas.

Alternative licensure strategies are relatively untested in the field of Technology Education. There are many issues and challenges awaiting those who blaze this trail.

This monograph was developed to provide an introduction to alternative licensure and to offer some general recommendations for implementing alternative licensure programs. We hope that it is of use to those who are studying, planning, and/or implementing alternative licensure programs in the field.

Len Litowitz
Mark Sanders

Alternative Licensure Models for Technology Education

Len Litowitz and Mark Sanders

The shortage of technology teachers in the United States is well known and well documented. Data reported by Volk (1993, 1997) suggests that the current shortage of technology teachers is, in large part, attributable to a decline in technology teacher education enrollments that began in 1975. Weston (1997) projected 13,089 technology education vacancies opening between 1996 and 2001. Litowitz (1998) surveyed state supervisors of technology education, with nearly half (49%) reporting that teacher supply would be "very inadequate" in their respective states over the next five years. Vaglia (1997) concluded that teacher education programs were supplying only 29% of the technology teachers needed in the southeast region of the United States.

The escalating shortage of technology teachers has led most states to instigate alternative licensure programs. Litowitz (1998) estimated 1,200 technology educators teaching without licensure (about 24/state) and reported that 29 of 40 (72.5%) state supervisors had, or were considering, alternative licensure for technology teachers in their state.

In light of the critical demand for technology teachers, the Council on Technology Teacher Education invited us to prepare a "white paper" that would set forth recommended alternative licensure requirements for technology teacher education. This paper is an attempt to do so, in hopes the recommendations contained herein will be useful to those responsible for establishing alternative licensing requirements for technology teacher preparation programs throughout the United States.

An Introduction to Teacher Licensure

In the United States, education is a states' right. Therefore, the authority to license teachers lies with the 50 individual states and the District of Columbia. The traditional method of teacher licensure is through completion of a state approved teacher preparation program. Individual colleges and universities that offer such programs have submitted detailed curricula to their various states for each subject area of teacher preparation that they offer. The various teacher preparation programs have then been approved by the state on a subject by subject basis. Individuals wishing to earn a teaching license must complete the required program of course work along with other state licensure requirements such as completion of a successful student teaching experience and passing the PRAXIS (National Teachers Examination).

It is important to recognize that licensure requirements vary widely from state to state, and even in some instances, among institutions offering programs of like subjects within the same state. Some samples of varying state teacher licensure requirements are as follows:

1. Some states require field observation experiences prior to student teaching while others do not.
2. Some states require only an initial certificate but others require advanced certificates often based upon continuing education credits earned.
3. Some states have even eliminated traditional teacher preparation programs in favor of "fifth year" programs that address teacher preparation after a conventional non-teaching degree has been completed in a subject matter area.

Terminology associated with initial teacher licensure is as varied as the means of earning teacher licensure. According to Feistritzer and Chester (1996) there are 30 different titles that are used to describe initial teaching certificates throughout the 50 states and the District of Columbia.

The Alternative Teacher Licensure Movement

Most alternative licensure programs grew out of the 1980s and the prediction of impending teacher shortages, but the alternative teacher licensure movement really addressed two goals:

- To allow more persons to become certified as teachers more quickly.
- To attract more people with life experiences into teaching without the necessary completion of a traditional undergraduate teacher preparation program.

The state of New Jersey first enacted alternative teacher licensure legislation in 1984 as a means of licensing candidates who had earned non-teaching degrees by some means other than issuing emergency certificates. Such emergency certificates had allowed nontraditional teachers to enter the classroom and teach while concurrently completing the requirements necessary to earn conventional licensure. Emergency licensure candidates did fill many classrooms that proved difficult to staff, but persons granted emergency licensure often entered the classroom without the benefit of any professional instruction regarding essential teaching topics such as classroom management, curriculum design or instructional methodology. New Jersey's innovative alternative licensure model attempted to attract liberal arts graduates into teaching by working with them to complete a combination of limited, but traditional, college course work and practicum under the tutelage of a master teacher.

Texas implemented an alternative licensure program one year after New Jersey in 1985. The Texas program was designed to specifically address a projected teacher shortage in the Houston Independent School District. Several years later this particular alternative licensure program was eliminated, but the concept of alternative teacher licensure took hold in Texas. Today approximately 20% of all teachers in Texas and New Jersey are prepared through alternative programs.

At present, virtually all but a few states have initiated alternative teacher licensure programs. Many of those programs were created in the late 1980s and alternative licensure programs have continued to grow in popularity in the 1990s. According to Feistritzer and Chester (1996) more and more states are now reserving the term "alternative licensure" to describe new programs specifically designed to bring quality adults who already have at least a bachelors degree—and many who have life experience—into the teaching profession. As a result of these alternative licensure programs, data indicate that the number of persons becoming certified to teach through alternative routes is growing rapidly, and alternative route licensure programs are attracting many talented individuals into the teaching profession. These individuals come from various walks of life, including but not limited to, ex-military personnel, persons with industrial or research experience, former teachers trying to get back into teaching, current teachers trying to become certified to teach in another area, and persons trained as teachers years ago who are only now interested in pursuing teaching.

Additionally, alternative route licensure appears to show some promise in recruiting a culturally and ethnically diverse teaching population as well. Feistritzer and Chester (1996, p. 5) reported that 26% of students are minorities, but minorities represent only 9% of the teaching profession. However, states with long-standing alternative route licensure programs like New Jersey and Texas have had greater success in attracting qualified minority teaching candidates through alternative programs than via traditional means of teacher preparation. For instance, in Texas 43% of all persons who earned teaching credentials through alternative licensure were from a minority population. In New Jersey where the minority student population is about 33%, one-fifth of all persons becoming teachers through alternative licensure means are minorities as well.

In spite of the various benefits of alternative licensure, not all research leans toward support of alternative licensure programs when compared to traditional means of teacher preparation. For instance, a study by Shen (1997) indicated that teachers earning licensure through nontraditional means are less likely to earn advanced degrees than teachers prepared through traditional means. The same study also found that teachers prepared through alternative licensure are less likely to view teaching as a lifelong career than their traditionally prepared counterparts, and that 2.4% of all alternatively licensed teachers had never earned any type of college degree.

However, David Haselkorn, president of Recruiting New Teachers, a Belmont, Massachusetts based nonprofit firm that promotes the teaching profession, asserts that Shen's study simply reinforces the obvious. Haselkorn contends that since teachers prepared through alternative licensure often teach in the most challenging urban districts, Shen's findings are to be expected. Haselkorn (1997, p. 2) states that "we've got to stop sending people, unprepared, into these school districts and hoping for the best."

Others such as Judy Schubach (1998, p. 1), President of the Minnesota Education Association, lambaste the alternative licensure measures as a reduction in teacher preparation standards by stating that "teachers with greater training in learning, child development, teaching methods and curriculum are more effective than those with less." Schubach goes on to state that more than 200 studies contradict the myths that "anyone can teach" and that "teachers are born and not made." A 1991 study by McDiarmid and Wilson is just one such study that supports the critical claims raised by Schaubach and others. McDiarmid and Wilson explored the mathematics knowledge of teachers enrolled in two different alternative licensure programs. The study concluded that individuals enrolled in these programs had shallow and insufficient knowledge of mathematics which did not appreciably improve later on while teaching the subject. McDiarmid and Wilson (1991) reached the following conclusion:

> Our analyses should raise questions about assumptions that underlie policy initiatives such as alternative routes: Specifically, should a major in mathematics—or in any discipline—be accepted as a proxy for the kinds of understandings of the subject essential to helping diverse learners understand critical ideas and concepts? What can and do teachers learn about subject matter from teaching it? What role do teachers' prior experiences with the subject play in learning about the subject from teaching it? (p. 102)

Darling-Hammond (1991, p. 10) reached a similar conclusion: "most research indicates that students taught by fully prepared teachers learn more than students prepared by teachers who are not fully prepared."

Regardless of these discrepancies, alternative teacher licensure models have gained in momentum and appear to be here to stay. Perhaps the best indication of the growing popularity of alternative licensure programs on a national basis over the last two decades is that only about one-third of all newly hired teachers are first-year teachers who have been prepared through traditional means. Teachers who have delayed entry into the teaching profession and previous teachers re-entering the teaching profession constitute another significant percentage of new teacher hires, but the numbers simply do not approach 100% staffing, particularly in rural and urban areas. Therefore, alternative licensure programs are necessary to help fill the void.

Subject Areas with Pronounced Shortages

Despite the dire predictions of impending teacher shortages in the early 1990s, no across-the-board teacher shortages had occurred in the United States by the mid 1990s. Yet, within certain subject areas,

teacher shortages are significantly more pronounced than in other subject areas. A study of alternative teacher licensure by Feistritzer and Chester (1996) identified the various programs offered within each state and the District of Columbia. In total, more than 100 alternative licensure programs were identified; many states offered multiple alternative licensure programs. The majority of these programs covered all subject areas, though others only covered most secondary subjects.

Only about 10 alternative licensure programs were targeted specifically toward attracting additional elementary teachers. Approximately 30 alternative teacher preparation programs were limited in nature, targeting teachers for specific subject areas of need. The most recurring subject areas mentioned were special education and foreign languages (including bilingual and English as a second language). A few programs also targeted mathematics and science teachers. Only one state (Oregon) specifically identified technology education by name as a subject area of critical need.

Evolving Methods of Alternative Licensure

There are a number of generic alternative licensure models that have evolved since the beginning of the alternative licensure movement in the early 1980s. These models generally target specific populations. Some target teachers for subject specific areas, but most models are not subject area specific. The most common alternative licensure models have evolved into various programs that target the following populations:

- Minorities
- Transitioning Military Personnel
- Mid-Career Changers
- Liberal Arts Graduates
- Persons interested in teaching Special Education
- Persons interested in teaching Math/Science
- Persons interested in teaching Bilingual or ESL
- Re-entering teachers (those trained to teach whom have not taught recently)
- Returning Peace Corps Members

Table 1 identifies the states that offer some form of tuition assistance for individuals pursuing teacher licensure through any of the alternative route licensure programs identified.

Toward Competency Based Alternative Licensure Models

Competency based programs, both traditional and alternative, appear to be the way of the future. In 1992, Lilly conducted an extensive review of literature on the subject of teacher licensure and state approval of teacher education programs. With regard to the licensure process, Lilly reached the conclusion that:

> ...we must admit that teacher licensure and state program approval in teacher education are predominantly political functions, and those who engage in such activities (whether as state agency employees or as university and school-based advisors to the process) depend little on research to inform their planning and actions. (p. 157)

With the goal of improving all forms of teacher preparation programs, Lilly's summation went on to make the case that regardless of subject matter or the type of teacher preparation program, either traditional or alternative, what is most important is that these programs deliver what preparatory teachers must know and be able to do at the time licensure is granted. Therefore, it is imperative to the field of technology education that competencies are identified so that all forms of technology teacher preparation programs, both traditional and alternative, are developed with the goal of producing well qualified teachers who meet these competencies.

Table 1.
States Providing Tuition Assistance for Individuals Pursuing Alternative Licensure

States Indicating at Least One Form of Tuition-Assistance Program Leading to Teacher Licensure							
State	Minorities	Transitioning Military Personnel	Mid-Career Changers	Recent Liberal Arts Grads	Individuals who want to teach SPED	Individuals who want to teach Sci/Math	Individuals who want to teach Bilingual/ESL
Alaska	X	X					
Arkansas	X	X	X	X	X	X	X
California	X	X	X	X	X	X	X
Colorado	X						
Delaware			X		X	X	
Kansas	X	X					
Kentucky	X						
Louisiana	X						
Maryland					X	X	X
Michigan	X						
Minnesota	X						
Mississippi					X		
Missouri	X	X				X	X
New Mexico					X		X
New York	X						
No. Carolina	X	X	X		X	X	X
So. Carolina			X	X	X		
So. Dakota		X					
Tennessee	X			X	X		
Texas	X	X	X				
Washington		X				X	
Wisconsin		X					

Source: Feistritzer, C. E. & Chester, D. C. (1996)

Technology Education and Alternative Route Licensure

Whispers of a dire nationwide technology teacher shortage began to surface throughout technology education in the early 1990s. States such as Florida and Texas, with traditional across-the-board teacher shortages, had begun recruiting in earnest at the International Technology Education Association conference, offering substantial incentives such as student loan forgiveness programs and "signing bonuses" to attract new teachers. A 1995 study by Weston (1997) and a team of graduate students from Old Dominion University helped to clarify the outlook regarding projected need for technology education majors nationwide. Weston's team surveyed State supervisors of technology education and university personnel to determine the number of technology educators employed on a state by state basis in 1995, and the projected need for technology education teachers at several points in the near future. Weston's work was admittedly difficult, as some states do not have accurate means of tracking such data. Depite these shortcomings, Weston's work indicated a nationwide demand for over 10,000

technology teachers by the year 2001 (Weston, 1997).

In order to assess the status of teacher supply in relation to this projected demand Litowitz surveyed a similar population in 1998. Litowitz' survey also requested information about alternative licensure measures that were being created to address the shortfall of qualified technology teachers which by now was occurring throughout most of the nation. Among other things, Litowitz found that teachers completing traditional technology teacher education programs were not meeting the demand, and that alternative licensure programs were beginning to emerge as a means of filling this void.

Existing Models for Alternative Licensure in Technology Education

There are a wide range of models currently being used by various states in the U. S. to address alternative licensure in technology education. Many of the examples outlined below are selected examples from Litowitz' original list. Others were gathered in a survey that Sanders conducted of state technology education supervisors and selected teacher educators in Fall 1999, in preparation for this monograph. We have categorized the various models under descriptive titles (e.g., "Suitable Background" or "Life Experience" Model) and have provided examples of states or universities that use each particular model.

"Suitable Background" Model (NY)

- Hold bachelors degree from an Engineering or Engineering Technology Program accredited by the Accreditation Board for Engineering and Technology (ABET)
- Complete 12 semester hours in education
- Complete student teaching experience
- Pass the PRAXIS I & II or New York State exams

"Suitable Background" Model (VA)

- Hold bachelors degree in Architecture, Design, Engineering, or Physics
- Complete 18 semester hours in Technology Education content coursework
- Complete 12 semester hours in education coursework (e.g., curriculum, methods, etc.)
- Complete regular student teaching experience
- Pass the PRAXIS I & II exams

"Suitable Background" Model (FL)

- Hold bachelors degree in any field
- Complete 30 hours in Technology Education
- Pass the Florida Department of Education subject area test

"Vocational/Middle School" Model (FL)

- Anyone with vocational licensure may teach middle school Technology Education

"Masters/Licensure" Model (General)

- Hold bachelors degree from teaching or non-teaching programs
- Complete conventional Technology Education licensure requirements while working on Technology Education masters degree
- May or may not require student teaching, depending upon the state
- May generally "double-dip" graduate classes for certification credit

"Life Experience" Model (VT)

- Credit provided for life experience
- Applicant must develop a curriculum
- Successfully complete an oral exam

"Military Career Transition" Model (Old Dominion University)

- Middle School (only) certification
- Entrance Requirement: Military personnel with bachelors degree (most have 15-18 years experience)
- Entrance Requirement: 15 semester hours of specified technical coursework in Technology Education

- Complete 36 semester hour masters degree in Technology Education (including 6 semester hours of student teaching)
- Pass the PRAXIS I & II exams

" Military to Classroom" Model (VA; proposed)

- Must be military personnel with bachelors degree "in their subject area"
- Must have 3 years of teaching experience in the military
- Pass the PRAXIS I & II exams

"Situation Specific" Model (MO)

- Candidates enter into an licensure contract approved by the local school district, local university, and state certification department
- There are no set number of hours; each contract is situation specific

"Add-On" Model (TX)

- Hold Texas teaching certification
- Hold a bachelors degree
- Pass the ExCET (Examination for the Certification of Educators in Texas) exam to be certified in Technology Education

"Add-On" Model (CA)

- Hold California Single-Subject Credential or Standard Secondary Credential.
- Pass 20 semester hours of undergraduate or 10 semester hours of upper-division or graduate course work approved by the California Commission on Teacher Credentialing at an accredited institution in any subject commonly taught in grades 7 through 12, other than the subject for which the teacher is already licensed to teach.

"Add-On" Model (SC, referred to as an "Out-of-Field Permit")

- Licensed in a teaching subject area
- Completion of 12 semester hours in Technology Education provides temporary Technology Education certification
- Must complete additional coursework and PRAXIS I & II exams for full certification

"Single Course Training" Model (MS)

- Endorsement for "Technology Discovery" course (9th grade course with 13 modules that is required in 525 of 546 secondary schools in Mississippi)
- Hold current Mississippi teaching license
- Complete a computer competency checklist
- Complete a 20 day training program provided by Mississippi Department of Education

"Back Door" Model (GA)

- Anyone certified to teach middle school may teach any middle school subject, including Technology Education

Recommended Alternative Licensure Models

As outlined above, there are a wide range of alternative licensure programs being implemented in various states throughout the US. The challenge confronting each of these programs is to effectively prepare technology teachers for the escalating number of technology teacher vacancies without compromising the quality of instruction and without undermining existing National Council for Accreditation of Teacher Education (NCATE) accredited technology teacher education programs. With this in mind, we undertook the charge presented to us by the CTTE Board.

In addition to a careful review of the literature and various state licensure and alternative licensure regulations, we also studied key documents in our field, such as the *NCATE-Approved Curriculum Guidelines: Initial Program in Technology Education* and the *Standards for Technology*

Education: Content for the Study of Technology (3rd Draft). Following these reviews, we developed three complementary components of a proposed model for alternative licensure for technology education:

- a "Conceptual Model" for alternative licensure;
- a set of "Suggested Competencies for Alternative Licensure" that "flesh out" the conceptual model for practical implementation; and
- a listing of "Possible Course Titles for Proposed Alternative Licensure Models" that illustrates the types of programs of study that might lead to alternative licensure.

The Conceptual Model

The conceptual model presented in Figure 1 is a combination of the set of competencies adapted from the *NCATE- Approved Curriculum Guidelines* as outlined above and the "Limited Licensure Model" that a number of states are already using.

We feel that a variation on the "Limited Licensure Model" outlined above—one that would limit the scope of the license either by grade level or by technical area—would be a model well suited to alternative licensure in our field.

On the one hand, the "Suggested Competencies" help to ensure that the alternative licensure program provides sufficient background to enable graduates to be effective technology teachers. On the other hand, limiting the scope of licensure to either middle school or a specific technical area provides alternative licensure candidates with the possibility of earning a technology education teaching license in a timely manner. In this way, we feel alternative licensure programs may maintain a level of quality that is critical to the long term goals of the profession, yet still provide an attractive option for those seeking to

A Conceptual Model for Alternative Licensure in Technology Education

Competencies & Required Experiences
Professional Development
Program Development
Technical Knowledge Base
Instructional Design & Delivery
Instructional Management
Suggested Clinical Experiences

LEADING TO:

Middle School Licensure

A series of broad-based courses in subjects such as Communication, Construction, Manufacturing, Transportation etc.

OR

Limited (Technological Systems) Licensure

A concentrated core of courses in a technological systems area, such as Communication, Manufacturing, Transportation, etc.

Figure 1. A conceptual model for alternative licensure in Technology Education.

enter the field through nontraditional pathways.

Those certified through the "Limited Licensure Model" would have the option to expand their certification in the future. That is they might, in time, become fully certified in all areas of technology education for grades K-12. Doing so, of course, would require additional coursework and possibly additional clinical experience beyond that obtained through the alternative licensure model we are proposing.

The "Suggested Competencies for Alternative Licensure" (outlined in the next section) are the backbone of the model we're proposing. This set of recommendations evolved from our review of the literature on alternative licensure, the various state models used in our field, and the *NCATE-Approved Curriculum Guidelines.*

At this time, we feel it would be premature to base specific alternative licensure program recommendations on the forthcoming *Standards* document, as it is not projected for publication until Spring 2000. In reviewing the state licensure and alternative licensure regulations, we found some very innovative approaches to teacher licensure as well as a number derived from, and similar to conventional licensure models.

After considerable deliberation, we decided to work from the *NCATE-Approved Curriculum Guidelines,* which have been used over the past decade to review and accredit dozens of technology teacher education programs. Thus, we felt the *NCATE Guidelines* had effectively been validated by the profession. The full text of the *NCATE-Approved Curriculum Guidelines* may be found at http://teched.vt.edu/ctte/.

In developing the "Suggested Competencies," we categorized the existing *NCATE Guidelines*, edited them for clarity, made additions where we saw needs specific to alternative licensure, and deleted where we found redundancy.

Suggested Competencies for Alternative Licensure in Technology Education

Upon completion of alternative licensure programs in technology education, graduates should be able to understand and demonstrate the following competencies:

Professional Development

1. Articulate a personal philosophy of technology education informed by current research in technology education, instructional design, student assessment, exceptional learners, and diverse populations.
2. Articulate the mission, goals, and objectives of technology education to public audiences.
3. Design and engage in a professional development plan consistent with the goals and objectives of the profession.

Program Development

1. Design and develop technology education programs, courses, goals, instructional objectives, learning activities, and assessment strategies consistent with current research findings.
2. Develop a strategic plan for technology education program improvement that includes a mission statement, rationale for change, goals and objectives, action steps, and program evaluation strategies.
3. Use the *Standards for technology education: Content for the study of technology* (ITEA, 2000) and when applicable, state standards to develop, evaluate, and revise a technology education program.

Technical Knowledge Base

1. Design, construct, and evaluate solutions to problems relative to various technological systems, including Communication, Production,

Power/Energy/Transportation, and Biotechnology systems.

2. Demonstrate safe practices with the tools, equipment, and materials used with respect to various technological systems, including Communication, Production, Power/Energy/Transportation, and Biotechnology systems.
3. Assess the impacts of past, present, and future technological innovations and systems while weighing ethical considerations and making value judgements.

Instructional Design & Delivery

1. Apply current learning theory and pedagogy in the design and delivery of technology education instruction.
2. Apply appropriate instructional technologies in the design and delivery of technology education instruction.
3. Evaluate existing curriculum and instructional materials to determine their effectiveness and appropriateness for technology education in grades K-12.
4. Design, develop, and deliver curriculum and instructional materials that:
   a. address the cognitive, psychomotor, and affective domains of learning in technology education;
   b. reinforce abstract concepts through concrete experiences; and
   c. enable students to assess the impacts of past, present, and future technological systems.
5. Incorporate digital components into technology education curriculum (e.g., CAD, computer control, etc.) when appropriate.
6. Incorporate digital technologies into instructional methods and materials (e.g., digital multimedia instructional presentations, computer simulations, etc.) when appropriate.
7. Integrate technology education curriculum and instruction with other disciplines, including science, mathematics, language arts, social studies, and the humanities.

Instructional Management

1. Organize and manage technology education instructional activities for both individual and group learners in grades K-12.
2. Manage student behavior in classroom and laboratory settings, with particular understanding of and attention to the individualized needs of exceptional learners and diverse student populations.
3. Organize and manage technology education student associations in grades K-12.

Suggested Clinical Experiences for Alternative Licensure Programs

All students completing an alternative licensure program should have the opportunity to practice/implement the concepts studied during their course work in a supervised clinical setting. Accordingly, students completing an alternative licensure program, should:

1. Participate in an Early Field Experience during the first half of the program of study leading to alternative certification. This field study should take place in a public school technology education program under the direct supervision of a technology education teacher educator and a "master" technology education teacher in the school. It should be of sufficient structure and duration to allow the student to observe, reflect upon, and internalize the nature and substance of the technology education teaching/learning experience.
2. Participate in a Student Teaching Internship experience in a public school technology education program under the direct supervision of a technology education teacher educator and a "master" technology education teacher in the school. This experience should last at least 8 weeks and engage the

student directly in a teaching role for a minimum of 150 contact hours.

3. Participate in a first-year new teacher mentoring program, in which a respected teacher—ideally a Technology Teacher—in the school system provides a mentoring experience. The intent is to provide a local support system critical to the success of any first-year teacher.

Possible Course Titles for Proposed Alternative Licensure Models[1]

The course titles listed below are intended only to *illustrate* the alternative licensure models presented in this paper. These course listings provide a general idea of the types of courses students might take as part of a "Middle School Licensure Program" or a "Limited Licensure Program." The identification of a rigid set of course titles, detailed course objectives, specific content, etc. is beyond the scope of this paper, and will undoubtedly vary from program to program and state to state.

Possible Course Titles for Middle School Technology Education Licensure[1]

Technical Coursework: 24 Semester Hours (SH)

- Communication Systems
- Energy, Power, Transportation Systems
- Production Systems
- Materials and Processes
- Technical Design (Drafting/CAD)
- Graphic Communications
- Electricity/Electronics
- Control Technology

Professional Coursework: 12-24 SH[2]

- Introduction to Technology Education
- Curriculum & Instructional Methods for Middle School Technology Education
- Student Teaching: 6-12 SH[2] (6 SH = 8 weeks or150 teaching contact hours)
- Educational Psychology[2]
- Foundations of Education[2]

Possible Course Titles for Limited Licensure (Communication Systems)[1]

Technical Coursework: 24 SH

- Design Fundamentals
- Technical Design I (Drafting & CAD)
- Technical Design II (Architectural Drawing & CAD)
- Graphic Communications
- 3D Modeling and Animation
- Analog/Digital Multimedia (Analog and Digital Audio and Video)
- Networking Systems
- Communication Systems

Professional Coursework: 12-24 SH[2]

- Introduction to Technology Education
- Curriculum & Instructional Methods for Technology Education
- Student Teaching: 6-12 SH[2] (6 SH = 8 weeks or 150 teaching contact hours)
- Educational Psychology[2]
- Foundations of Education[2]

Possible Course Titles for Limited Licensure (Production Systems)[1]

Technical Coursework: 24 SH

- Design Fundamentals

[1] All courses are 3 semester hours, unless otherwise noted.

[2] Persons already certified (in an area other than Technology Education) would not need Educational Psychology, Foundations of Education, or the additional 6 semester hours of Student Teaching.

- Technical Design I (Drafting & CAD)
- Technical Design II (Architectural Drawing & CAD)
- Materials and Processes I
- Materials and Processes II
- Construction
- Computer Control
- Manufacturing Systems

Professional Coursework: 12-24 SH[2]

- Introduction to Technology Education
- Curriculum & Instructional Methods for Technology Education
- Student Teaching: 6-12 SH[2] (6 SH = 8 weeks or 150 teaching contact hours)
- Educational Psychology[2]
- Foundations of Education[2]

Possible Course Titles For Limited Licensure (Power / Energy / Transportation Systems)[1]

Technical Coursework: 24 SH

- Technical Design I (Drafting & CAD)
- Technical Design II (Advanced CAD)
- Electricity & Analog Electronics
- Digital Electronics
- Hydraulics/Pneumatics
- Computer Control
- Power & Energy Systems
- Transportation Systems

Professional Coursework: 12-24 SH[2]

- Introduction to Technology Education
- Curriculum & Instructional Methods for Technology Education
- Student Teaching: 6-12 SH[2] (6 SH = 8 weeks/150 "teaching contact hrs.")
- Educational Psychology[2]
- Foundations of Education[2]

Closing Comments

At the root of the recommendations for alternative licensure in technology education outlined here is the belief that an alternative licensure path should not compromise the quality of the profession by creating an avenue to allow under-qualified individuals to enter the field. Where appropriate, alternative licensure programs can benefit the profession by recruiting new teachers with a rich assortment of backgrounds and talents into the field.

The intent of the model recommended here is to allow adequate flexibility while providing sufficient structure to encourage the development of high quality alternative licensure programs. By design, the model should allow a range of implementation strategies from state to state. At the same time, we feel it is important to the long-term health of the profession that the intent of these recommendations not be compromised for the sake of expediency.

We see this presentation of the "Conceptual Model," "Suggested Competencies for Alternative Licensure," and "Possible Course Titles for Proposed Alternative Licensure Models" not so much as a fait accompli, but rather a starting point for a conversation in the profession about appropriate requirements for alternative licensure programs. We hope those making decisions regarding licensure within the various states, as well as Technology Education supervisors and teachers, will find these recommendations helpful.

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